chapter 14

Disability Studies in Inclusive Education

The nature of hearing impairment and its impact on learning

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Chapter learning outcomes

After completing this chapter, you will be able to:

- Reflect on experiences of children who are D/deaf or hard of hearing in an empathetic way.
- Understand the nature of hearing impairment, terminology around hearing loss and commonly known causes.
- Examine the effect of severe to profound hearing impairment on children who are D/deaf in the classroom.
- Identify barriers to learning experienced by learners who are D/deaf or hard of hearing.
- Explain the importance of human rights and policies for learners who are D/deaf or hard of hearing.

Preparatory activities

WATCH: Being part of the Deaf community

Creator: Jabaar Mohamed
Date: 2021
Duration: 10 minutes

READ: Critical needs of students who are deaf or hard of hearing: A public input summary

Author: Christen Szymanski, Lori Lutz, Cheryl Shahan & Nicholas Gala
Year: 2013
Estimated reading time: 20 minutes
File size: 785 KB

READ: Deafness and hearing loss

Author: World Health Organization
Year: 2023
Estimated reading time: 10 minutes
File size: 193 KB

WATCH: Talk Africa: Spotlight on deaf rights

Creator: CGTN Africa
Date: 2021
Duration: 30 minutes

REFLECTION

Estimated time: 30 minutes

Reflect on themes and issues raised in the resources above and create a five-minute vlog or short blog commenting on the videos. Consider who is part of this population, the common themes raised, and the key issues which you feel come out of these videos. How could these issues be taken forward?

Introduction

In this chapter, we discuss what hearing loss is and its impact upon learning. We examine the concepts of D/deaf and hard of hearing and find out what it is like for D/deaf or hard of hearing children, how they perceive their world and how they would like to be supported. We will talk about the importance of hearing the voices of children with disabilities and their families and how the curriculum needs to be adapted to meet their learning needs. We will also recognise the need for various kinds of support in both inclusive and special school settings. Lastly, we explore and introduce the human rights and policies for learners who are D/deaf or hard of hearing.

The nature of hearing impairment

In this section, we will unpack the more technical aspects of hearing impairment in terms of what it is physiologically and how it is defined according to clinical guidelines by the World Health Organization (WHO).

The sense of hearing

Hearing is one of the basic human senses with which we perceive the sounds around us; through hearing we engage with our environment, communicate with others, express our thoughts, and learn about the world around us (**WHO, 2023**). Hearing is a function facilitated by the ear and the entire auditory system. The auditory system is made up of three main areas: the outer, middle and inner ear (Figure 1). The outer ear includes the ear flap, ear canal and eardrum. The middle ear is in an enclosed chamber behind the eardrum and includes the three tiniest bones (ossicles) in the body, often described as the hammer, anvil and stirrup. The inner ear consists of the cochlea, a snail-shaped tube filled with fluid. When sound waves reach the eardrum they cause it to vibrate. These vibrations are amplified by the ossicles and transmitted to the cochlea.

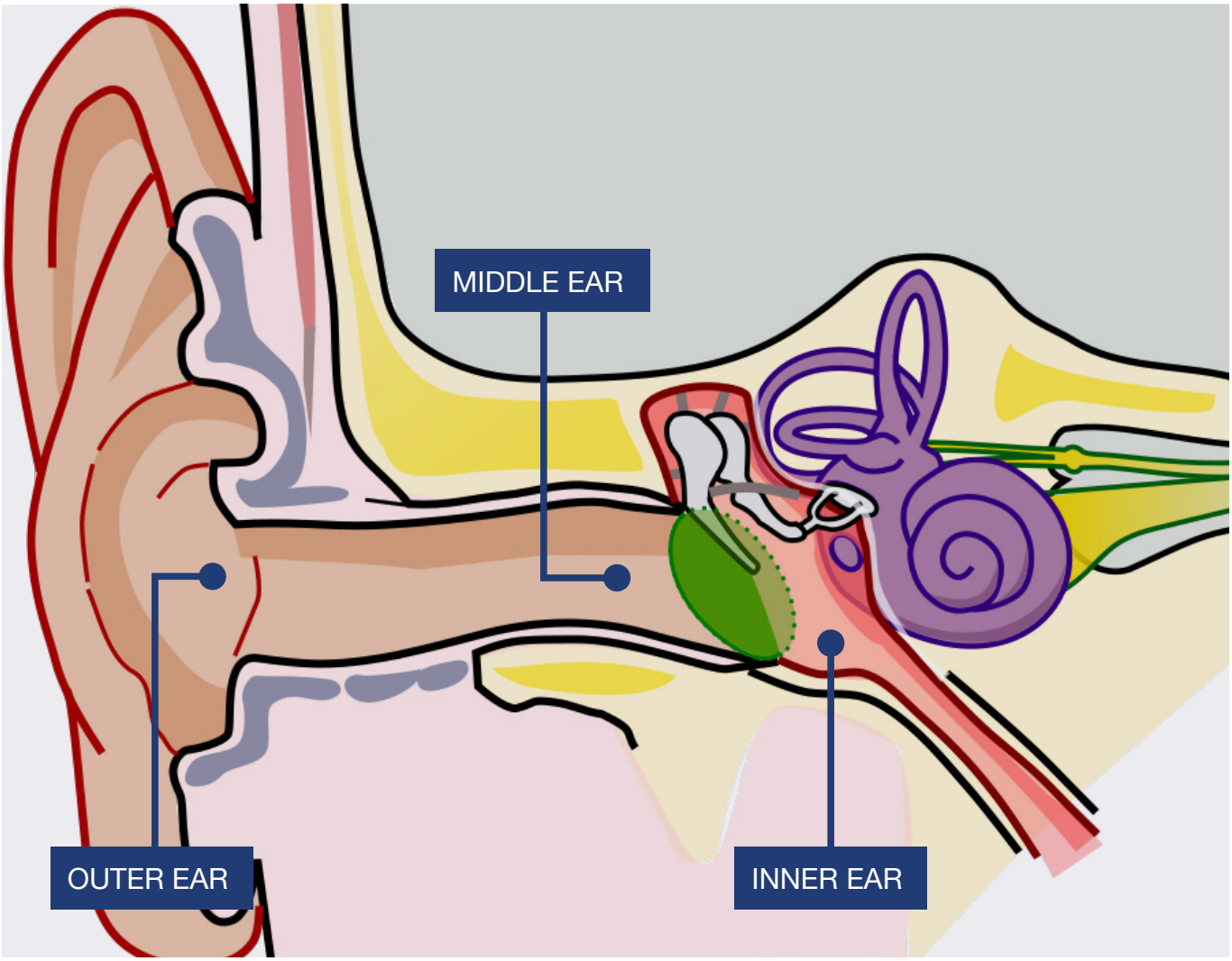

Figure 1: Anatomy of the ear (Adapted from: **Wikimedia Commons**, CC BY)

Watch the video on the journey of sound to the brain to learn more about how the ear structures work to perceive and deliver sound.

WATCH: The journey of sound to the brain

Creator: National Institutes of Health
Date: 2018
Duration: 3 minutes

The auditory system is integral in collecting sound input (speech, music, noise) for processing through the ear structures and comprehension in the brain (Figure 2).

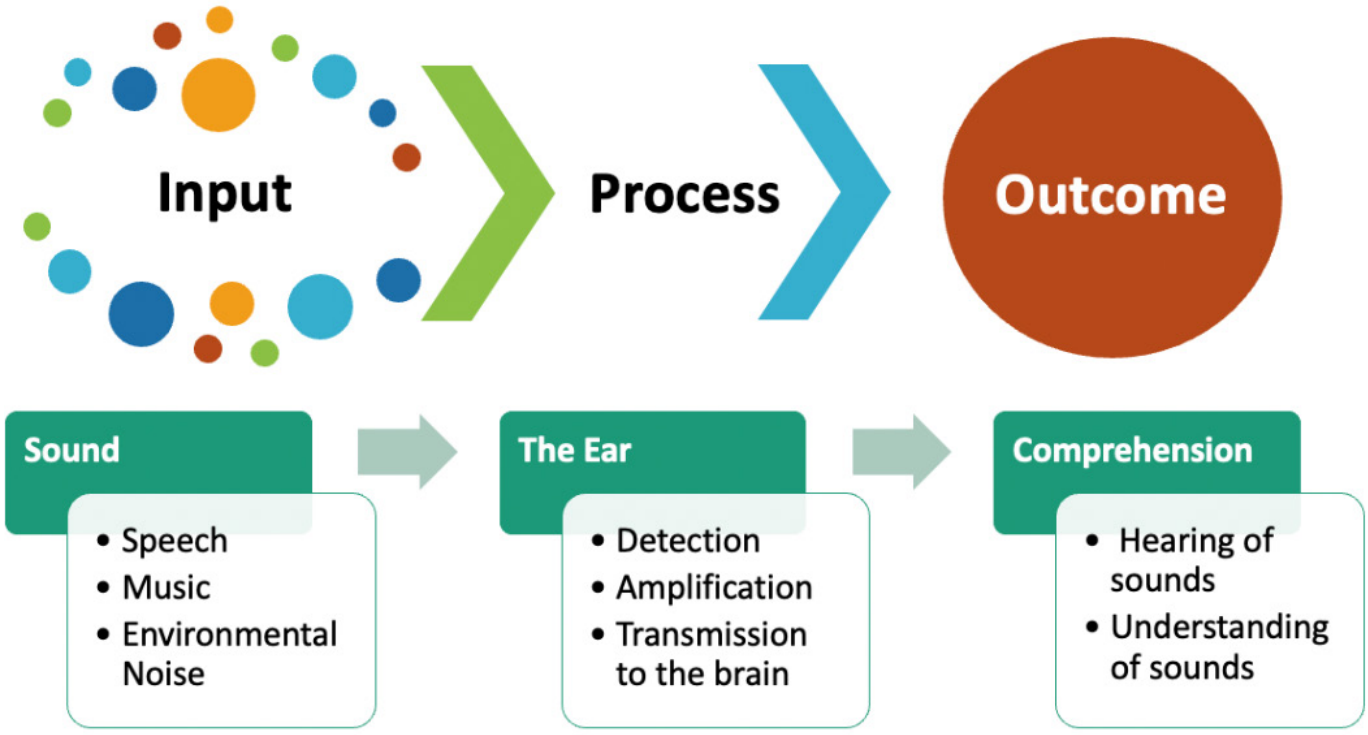

Figure 2: How sound is processed in the ear

What is hearing loss?

Hearing loss is a partial or total inability to hear. In other words, hearing loss occurs when there is a physiological malfunction in the auditory system. Hearing loss is diagnosed by an audiologist using a hearing sensitivity test that measures sounds in decibels (dB) at different pitches (frequencies) per ear to determine hearing function. According to the WHO, being able to hear at 20 dB means one is able to hear leaves rustling, a whisper, birds chirping, etc. A person who is not able to hear at 20 dB or better in both ears is said to have hearing loss. There are various terms used to name or label hearing loss.

GLOSSARY: Audiologist

An audiologist is a health professional qualified to diagnose and rehabilitate hearing conditions as well as work with improving function and quality of life for those living with communication disorders such as hearing loss.

Terminology around hearing loss

After one is tested, there are many terms that can used to "name" one's hearing sensitivity. In this chapter, we use the term "hearing loss". Other terms that have been used throughout the book include "hard of hearing", "hearing impaired" and "deaf". See Figure 3 on the varying terminology used around hearing loss.

Figure 3: Terminologies used in referring to hearing loss

There are varying impacts a term or naming classification can have on the person being diagnosed in terms of stereotyping around disability in general. It is therefore worth noting that the terms used to describe medical diagnosis are used with caution so as not to fuel negative stereotypes, particularly as relates to children. Furthermore, it is worth stating that there is a difference between Deaf and deaf. The term "deaf" with a small "d" refers to the audiological condition of not hearing/hearing loss we have described and can range from mild to profound severity; while the term "Deaf" with a capital "D" refers to a group of people who have hearing loss and identify culturally and linguistically as Deaf. Deaf culture and identity is informed by a set of social beliefs, behaviours, traditions, history, values and shared institutions of communities that are influenced by deafness and use sign languages as the main means of communication.

How is hearing loss determined?: Understanding audiology assessments

The audiologist can, from the hearing sensitivity test, diagnose and classify hearing loss according to type and severity in each ear. An audiogram, which is a diagram used by the audiologist to visually illustrate results of the hearing test, is the clinical record used to document hearing sensitivity.

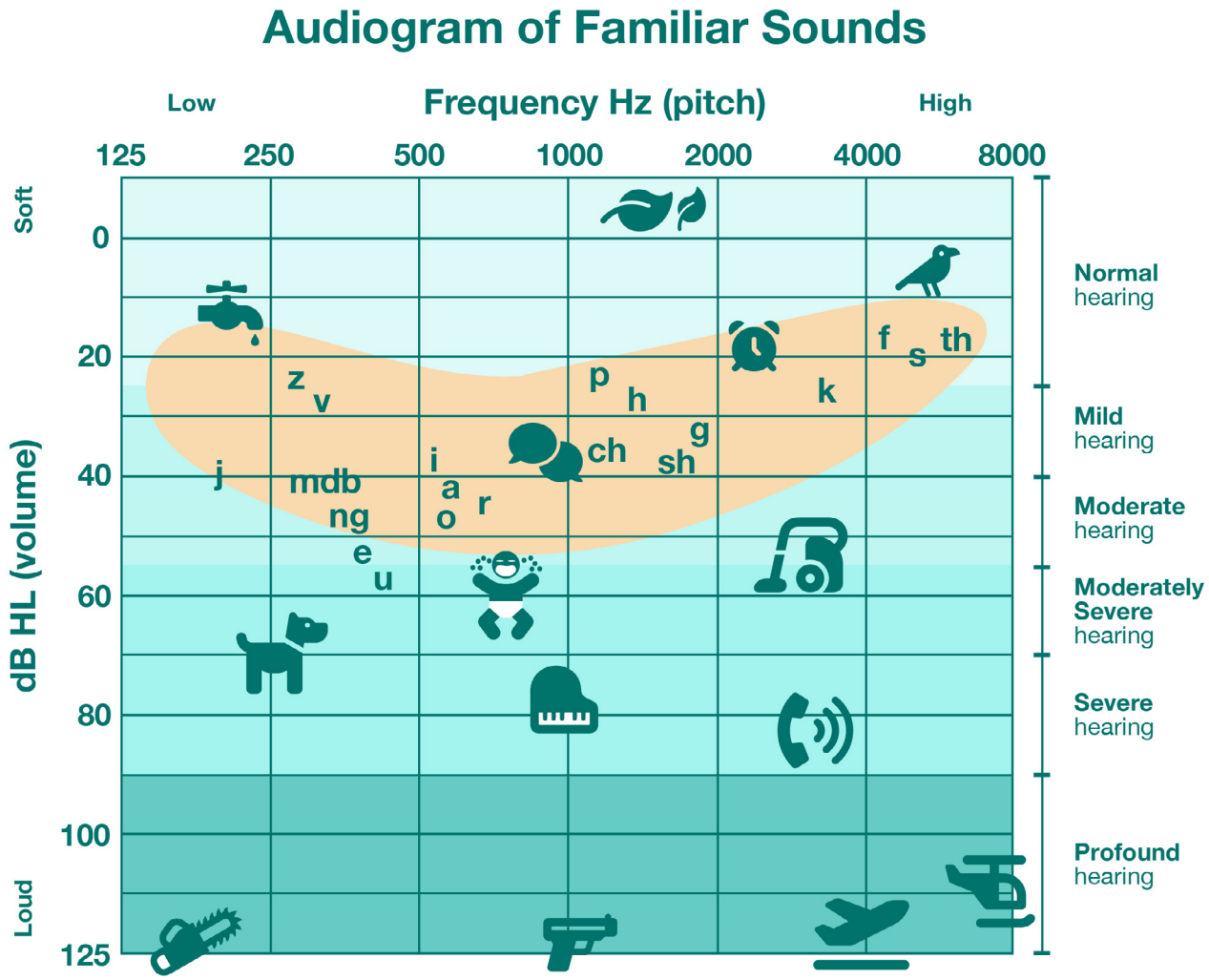

Figure 4: Audiogram showing severity of hearing loss and everyday associated sounds (Adapted from: **Maricopa Community Colleges**)

The audiogram shows the severity of hearing loss based on the hearing sensitivity in dB HL. Hearing loss may be of a mild severity up to profound. This means we associate and name the hearing level of an individual in line with the expected functional impact the hearing loss may have on their listening, hearing and communication. Hearing loss is classified as being clinically disabling by the WHO once it is of a moderate severity or worse.

It is also worth noting that the functional impact of hearing loss is the key factor to describing and contextualising its “disabling” nature outside of the clinical categorisation according to severity on the audiogram. For example, the images of everyday sounds and objects on the audiogram illustrate the kind of sounds that a person with a certain severity of loss may miss such as not being able to hear a helicopter when you have a profound hearing loss. This is important to highlight as the term “disabling” can be loaded with varying implications for interpretation based on use. In this instance, it is used to denote the clinical and or the standard clinical definitions to classify the implied functional impact of hearing loss in everyday life.

Different types of hearing loss

A hearing sensitivity test administered by an audiologist helps determine the type of hearing loss in each ear. Hearing loss types are named and classified according to area thought to be affected in terms of function, as determined by the three parts of the auditory system: the outer, middle or inner ear. There are therefore three types of hearing loss: sensorineural, conductive and mixed.

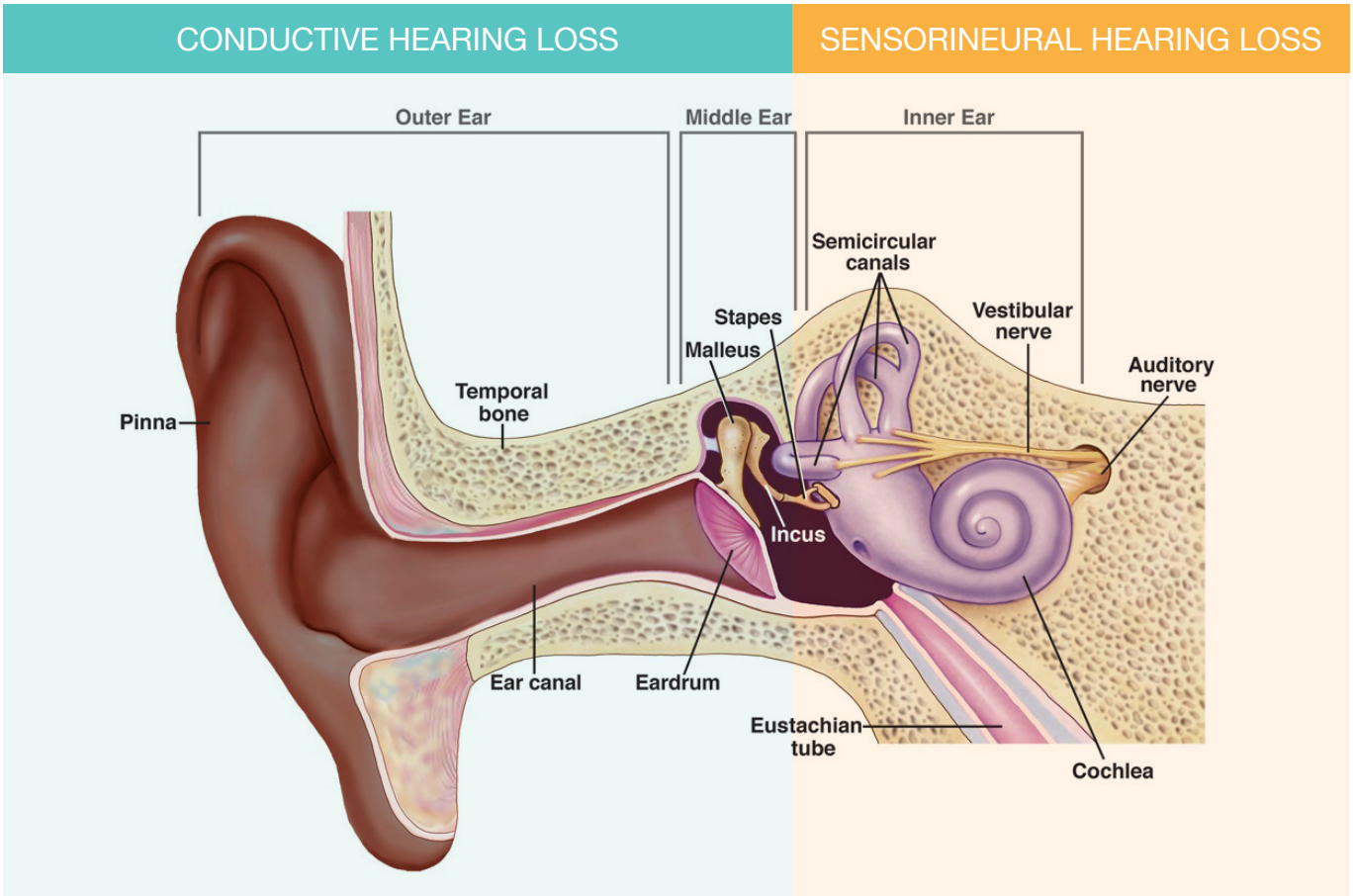

Figure 5: Different types of hearing loss (Adapted from: **National Institute on Deafness and Other Communication Disorders**)

Sensorineural loss is the permanent kind of loss where the sensory or neural hearing organs, most likely in the inner ear, are irreversibly affected. Conductive loss is a temporary but often recurrent kind of loss that occurs when there is a difficulty with the conduction of sound through the middle ear and hearing structures, typically when the middle ear is affected by an ear infection. Conductive losses are the most common in children and are by nature temporary, but can reoccur. Mixed loss is when there is both a sensorineural and conductive component to the hearing loss.

Commonly known causes for hearing loss

Hearing loss can be congenital, meaning one can be born with it, or acquired across one's lifespan after birth. The most common causes of congenital (from birth) or acquired hearing loss according to the WHO are listed in Table 1. This is not an exhaustive list, but it provides a useful guide to the most common causes. Among children, chronic ear infections are the most common cause of hearing loss; while noise and age-related factors are common causes in adults.

Table 1: Common causes for congenital and acquired hearing loss (Source: **WHO, 2023**)

Common causes of congenital hearing loss	Common causes of acquired hearing loss
Maternal rubella	Infectious diseases, including meningitis, measles and mumps
Syphilis	Chronic ear infections
Infections during pregnancy	Use of certain medicines, such as those used in the treatment of neonatal infections like malaria, drug-resistant tuberculosis and cancers
Low infant birth weight	Injury to the head or ear
Birth asphyxia (a lack of oxygen at the time of birth)	Excessive noise
Use of drugs (medical or otherwise) during pregnancy	Ageing (due to degeneration of sensory cells)
Severe jaundice in the neonatal period (which can damage the hearing nerve in a new-born infant)	Wax or foreign bodies blocking the ear canal
Genetic or inherited conditions	N.A.

Symptoms of hearing loss

The video by Hear-it provides an overview of common signs and symptoms of hearing loss in children.

WATCH: Hearing loss in babies and toddlers

Creator: Hear-it
Date: 2018
Duration: 2 minutes

Over and above the common symptoms for hearing loss, disabling hearing loss can also impact the child's developmental milestones, including:

- Speech and language developmental delays.
- Failure to make certain cognitive milestones.
- Negative socio-emotional/behavioural effects.
- Negative scholastic/academic impact.

For adults, or in older children able to express/report on symptoms, some of the commonly reported symptoms include:

- Hearing muffled speech and other sounds.
- Difficulty understanding words, especially against background noise or in a crowd.
- Frequently asking others to speak more slowly, clearly and loudly.
- Needing to turn up the volume of the television or radio.
- Withdrawal from conversations and avoidance of some social settings.

The above listed signs and symptoms are not exhaustive; annual health screening and check-ups are always encouraged to accurately detect the presence of any abnormalities.

Prevalence of hearing loss

Globally, hearing loss is the third leading condition that accounts for years lived with disability (**GBD 2019 Hearing Loss Collaborators, 2021**). In 2021, an estimated 430 million people across the world were living with disabling hearing loss, and of these, 34 million are children (**WHO, 2021**). Most cases of children with disabling severe hearing loss occur in Sub-Saharan Africa, with cases being congenital or early acquired (**WHO, 2021**). Added to this, over one billion young people across the world are at risk of noise induced hearing loss due to unsafe listening practices (**WHO, 2023**).

The relationship between hearing loss and learning in the classroom

Before we unpack the link between learning and hearing loss in the classroom, we need to expand on the link between spoken language development and hearing loss. This is because, much teaching instruction in the classroom is done through spoken language. The relationship between hearing and learning is that we learn from what we hear in spoken language (see Figure 4). So let's look into spoken language development and the impact of hearing loss.

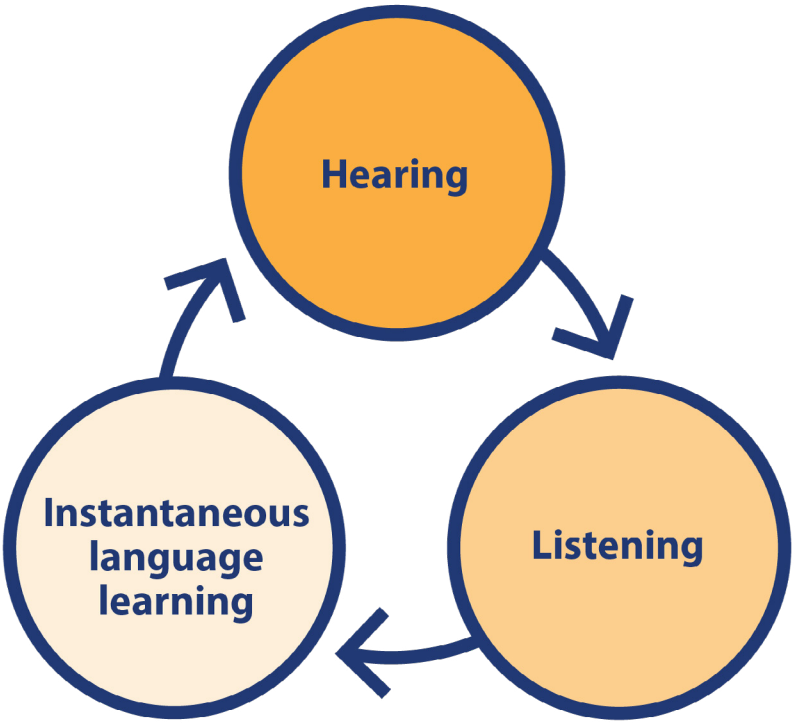

Figure 4: Relationship between hearing and learning

Children learn language through listening exposure (**Pittman, 2008**). This means, (1) we learn to attach meaning (receptive language) to what we hear (speech sounds) and (2) we then learn to say (through expressive language) what we hear. Therefore, sense of hearing is important for both receptive and expressive spoken language development. Hearing gives access to speech sounds that the brain uses through listening and the listening experience is used for learning key auditory skills that facilitate language learning. Thus, the presence of a hearing loss presents as an acoustic obstacle that alters the incoming speech sounds.

A good illustration of how hearing is involved in language development are some of the stories of "wild children" who were raised by animals and thus "spoke" like them. This is an extreme example of how the brain uses what it hears to learn language.

It is important for us to expand a little more on specific areas of language development affected by the presence of hearing loss in order to show the link between hearing loss and learning in the classroom. Please take five minutes and watch this video by The THRASS Institute introducing the concept of phonology and phonemic awareness.

WATCH: Phonemic awareness: What is it? Why is it important?

Creator: The THRASS Institute
Date: 2017
Duration: 5 minutes

Phonology

Phonology is defined as the systematic organisation of sounds in a language and what we call "phonological skills" (the ability to hear, identify and manipulate speech sounds) is the key skill that is affected by hearing loss, which then impedes spoken language development. A good example to illustrate how phonology and learning is used is in how most of us may have learned the alphabet in our early schooling years. This example on how we learnt the alphabet is a quick practical experience to explain phonology and its implications for learning. In Figure 5, the relationship between what we hear (hearing) through the sound of the letters (phonology) can facilitate learning and in turn create the foundation for reading and writing skills (literacy and learning). Phonology is a critical contributor to learning through audition and there are many aspects of phonology, as represented in Figure 6.

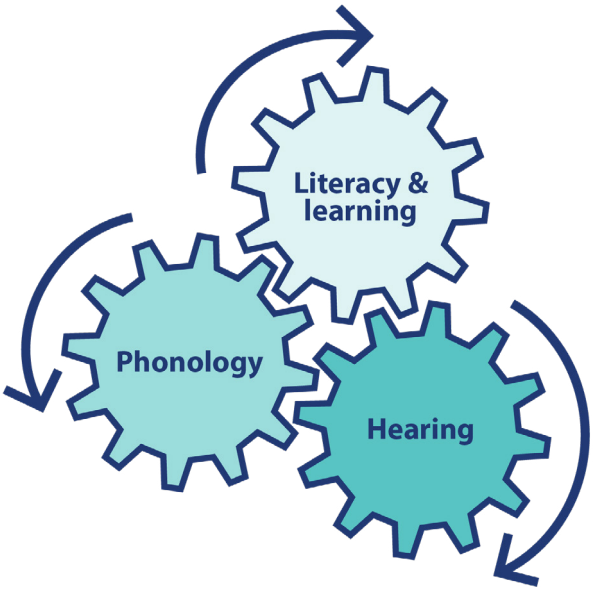

Figure 5: Relationship between hearing, phonology and literacy

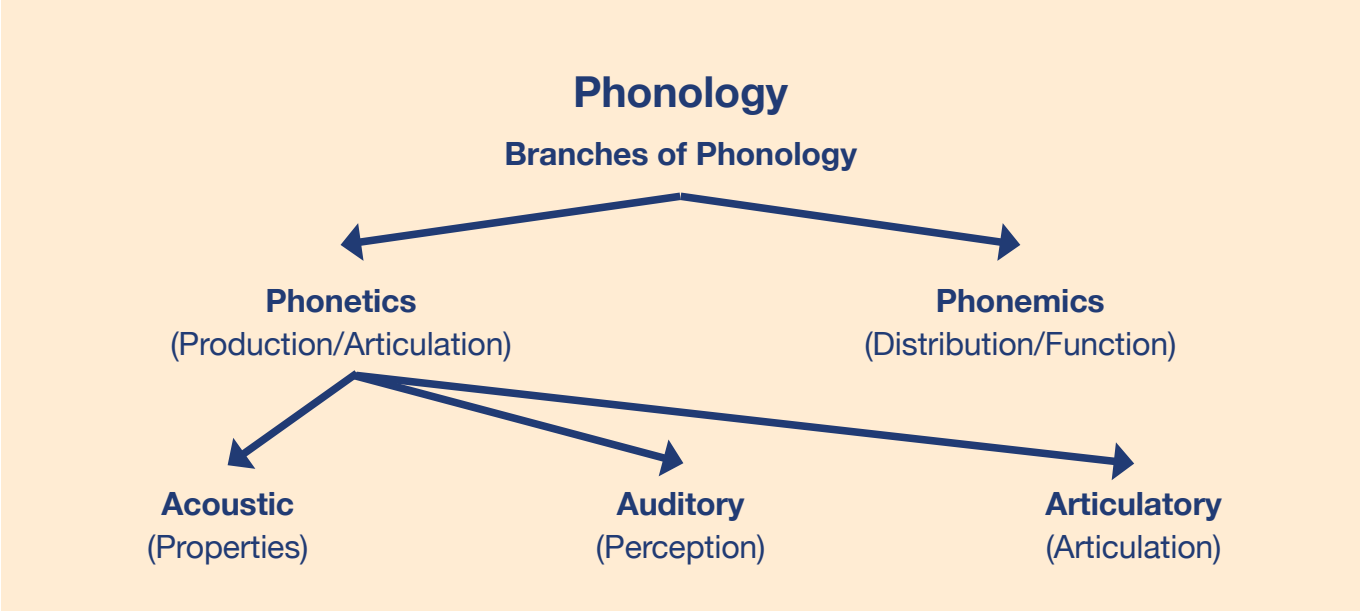

Figure 6: Aspects of phonology

If we look into the classroom learning environment, where, in most cases, the teacher is in front of the class and learners are customarily seated in rows throughout the class, listening. Implied in using spoken language for teaching instruction and literacy acquisition, is the assumption that learners can hear the teacher and have developed the necessary language skills to follow and understand the teacher. Bearing in mind everything discussed above, it is clear that should the child have hearing loss, there is a challenge presented. The first challenge here is the *audibility* of the teacher to the child which may be impaired; secondly, depending on type and severity of loss, the child may have a language development delay. Both challenges may impede learning for the child with hearing loss.

Audibility

With regards to audibility, the quality, loudness and clarity of the teacher's voice to the child, distance between the child and teacher as well as background noise in the class are some of the factors to consider in relation to the child's hearing level. These factors may exacerbate the negative impact of hearing loss on the child's ability to learn. Some simple adaptations that can however be made to improve audibility, including:

- Ensuring the teacher's voice is audible to the child.
- Shortening the distance between the teacher and the child.
- Decreasing or eliminating background noise during teaching time.

Another key aspect to consider is rehabilitation of hearing loss with the aim to improve audibility and thus access to spoken language learning. There are various options for hearing-loss rehabilitation that are undoubtably affected by resource availability as well as other contextual factors, including, most importantly, parents' choice of their child's language of communication. It is important to note that not all parents of hearing-impaired children choose to have their children communicate verbally and learn through spoken language. Thus, only when spoken language is the choice, can matters of using audiological rehabilitation to improve the child's audibility to access spoken language for learning be a factor for consideration. Most commonly, those that choose the spoken language route, are introduced to hearing amplification devices (hearing aids). This is an entire area on its own; for the purposes of this chapter, what is important to note is that hearing amplification devices are an assistive rehabilitative method and success thereof depends on type of hearing loss and many other contextual factors, including continued rehabilitation to assist the child's brain to optimise the sounds accessed through the device.

Language delay

Because spoken language is learned through listening and hearing, most children with hearing loss present with a language development delay. While what is important to note is that although the child with hearing loss may be on par with age-related cognitive and intellectual milestones, they may have a delay in the development of receptive (ability to understand) and expressive (ability to speak) language. This affects how they learn in the classroom, as the ability to understand the language of instruction is an important aspect of learning.

This is critical to note as children with hearing loss are often overlooked and erroneously referred for learning difficulties, intellectual/cognitive delays and various other conditions. These can co-occur, but the presence of hearing loss does not always imply a cognitive or intellectual learning difficulty. What is often an issue that exacerbates learning difficulties is that most children with hearing loss have problems retaining new information and paying attention in class; they also tend to "misbehave" during lessons. Most of these factors are related to the brain missing information and being unstimulated in a classroom set-up when audibility is impaired, and a language barrier exists. Imagine being placed in a classroom where you are expected to learn, but you do not hear nor understand the little you hear because the language is foreign, and you are a child.

Many of these challenges do not have a quick fix and may require the teacher to refer to a speech language therapist to assess language capabilities so that they can adapt their support to the child appropriately. Some of the quicker fixes may include:

- Using repetition during lessons, as this helps with retention.
- Including written notes to augment teaching and the use of visual aids.

Overall, the link between learning in the classroom and hearing loss is layered and can be influenced by many other factors. There are various resources you can consult on this topic to increase your knowledge in this area. One of these is the "**Disability Inclusion in Education: Building Systems of Support**" Massive Open Online Course (MOOC), which explores topics such as "What teachers need to know to be able to support D/deaf and hard of hearing learners" and "Education for learners who are D/deaf or hard of hearing". We particularly recommend that you look through "Effects of severe to profound hearing loss on the D/deaf and hard of hearing child". You can also consult some of the additional reading resources listed at the beginning this chapter. Also, take some time to look into some classroom accommodations for children with hearing loss shown in the article by Anderson and Matkin (**2007**) titled "Relationship of hearing loss to listening and learning needs".

Human rights and policy frameworks for children who are D/deaf or hard of hearing

It is important to delve into human rights and policy frameworks for learners who are D/deaf or hard of hearing. This is a critical content area within the broader field of disability inclusion and inclusive education. Skrebneva (**2015**) identifies key South African policy documents and legislative guides on inclusive education that directly impact learners who are D/deaf or hard of hearing. These policy documents relate directly to the development and implementation of an inclusive educating system which is envisioned to accommodate and enable a conducive learning and developmental environment for learners who are D/deaf or hard of hearing. Some of the South African policy documents and legislative guides include:

- **White Paper on Education and Training in a Democratic South Africa (1995)**
- **The South African Schools Act (1996)**
- **White Paper on an Integrated National Disability Strategy (1997)**
- **Education White Paper 6: Special Needs Education: Building an inclusive education and training system (2001)**

Education White Paper 6 is of particular importance, in that it outlines a framework for establishing an inclusive education and training system, details a funding strategy and lists key strategies to be adopted in establishing the system in South Africa. Skrebneva (**2015**) summarises these strategies as follows:

- Emphasising capacity building at leadership and managerial levels and fostering intersectoral collaboration at all levels.
- Strengthening education support services, with a focus on the conversion of special schools into resource centres and developing support teams at district and institutional levels.

- Expanding access to and provision of education.
- Developing a flexible curriculum, curriculum support, appropriate assessment approaches, appropriate development of materials, and use of assistive devices.
- Launching a national advocacy and information programme in support of inclusion.

White Paper 6 further emphasises that one of the most significant barriers to learning for learners in special and "ordinary" schools is the curriculum (**Skrebneva, 2015**). Some of the barriers to learning include:

- The content (i.e. what is taught).
- The language or medium of instruction.
- How the classroom or lecture is organised and managed.
- The methods and processes used in teaching.
- The pace of teaching and the time available to complete the curriculum.
- The learning materials and equipment that is used.
- How learning is assessed.

The most important way of addressing some of these barriers is to ensure that the process of learning and teaching is flexible enough to accommodate different learning needs and styles according to the learners that are in the system.

Conclusion

This chapter has taken you through key concepts in understanding the sense of hearing and the nature of hearing impairment as a foundation to unpacking the relationship between hearing loss and learning in the classroom and accommodations for learners who are D/deaf or hard of hearing. We also explored the human rights and policy frameworks in inclusive education.

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